

URGENT PROBLEMS OF FOOD SECURITY IN THE REPUBLIC OF CHAD: ANALYSIS AND DEVELOPMENT PROSPECTS

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The problems of socio-economic and political development of the country. The comparative analysis of food security indicators with similar regional and world indices. GDP per capita and the food insecurity indicator based on the infant mortality rate. The dynamics of the total factor productivity and output per worker. The ways of solving the food problem.

Keywords: food problem, food insecurity indicator, infant mortality rate, factor productivity.

СОВРЕМЕННЫЕ ПРОБЛЕМЫ ПРОДОВОЛЬСТВЕННОЙ БЕЗОПАСНОСТИ РЕСПУБЛИКИ ЧАД: АНАЛИЗ И ПЕРСПЕКТИВЫ ИХ РЕШЕНИЯ

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Рассмотрены проблемы социально-экономического и политического развития страны. Проведен сравнительный анализ основных показателей продовольственной безопасности с аналогичными региональными и мировыми индексами. Рассчитаны ВВП на душу населения и индикатор продовольственной небезопасности страны на основе коэффициента младенческой смертности. Оценена динамика совокупной факторной производительности и выработки на одного работника. Предложены пути решения продовольственной проблемы.

Ключевые слова: продовольственная проблема, индикатор продовольственной небезопасности, коэффициент младенческой смертности, факторная производительность.

According to the Committee on World Food Security estimates, 842 million people in total or one in eight people in the world suffered of malnutrition during the period of 2011–2013. That means that they do not have enough food essential for leading an active lifestyle. The Food Crisis of 2007–2008 and the forthcoming economic and financial recession of 2009 continuing in 2012 pointed to the urgent problems that millions of families worldwide face and struggle — malnutrition and poverty, lack of means of resources for a decent and adequate living conditions [1, p. 5]. The World Bank data show that Africa is the region of concert in the field of food security. The biggest amount of

the poorest (33% of the world population) lives in the region [2].

The Republic of Chad is a typical country of the African continent. It is proved by extremely low standards of living, agricultural specifics of the economy, non-developed means of production and its dependence of the former colonial powers. According to the latest data, about 40% of population live at \$ 1.9 per day (super poor), comparing with Russia's 0.04% [3]. The country is situated in the northern part of Central Africa. The total population is 11.6 million people, 49% of which is children under 15 [4]. Chad is one of the poorest and least developed countries in the world. Economic backwardness of Chad is explained by

the difficulties the country faced: limitation of human and natural resources, specific geographical position, absence of outlet to the sea. The archaic character of social and economic structures is another obstacle. The antiquated communal, semi-feudal and capitalistic lifestyle still prevails in the society. More than 80% of the population lives below the poverty line. That is typical for the countries of the region. According to the official statistics, it ranks last but one in the list of low income and food deficit countries [3].

The country is strongly specialized in agriculture. 80% of economically active population works in agriculture, 2/5 of them are occupied in cattle breeding. Live cattle are the essential export item. Because of the semi-arid climate cropping is only possible in the south of the country. However collective farming and manual labor take place commonly. The only export item is cotton produced in the south and in the west. It counts 70% of currency earnings [6]. Despite its agricultural specialization the republic faces the problem of food security and is included into the list of Food-Deficit Countries.

Harsh climatic conditions complicate the situation a lot. Frequent droughts lead to failure of crops and,

as a result, death of livestock. The arising deficit of provisions facilitates the rise in price which makes purchase of the foodstuff almost unavailable to the poor [1]. Malnutrition combined with rampant diseases (tuberculosis, leprosy and malaria), shortage of clean drinking water, shortage of medical institutions, insanitary conditions and lack of infrastructure lead to numerous diseases and deaths [2]. According to the statistics, the life span in the Republic of Chad does not exceed 50 years. The country ranks third in the child mortality rate (148 deaths per 1000 newborns), behind Angola and Sierra Leone [4].

As a result of political instability, streams of refugees arrive in the country every year, which complicates the problem of food security even more. Besides, the country is much dependent on the foodstuff arrivals from such partner countries as France, the USA and Cameroon. The amount of top imports (sugar, flour, milk, etc.) accounted for 153, 5 million dollars in 2015 [6].

Let us move on to the analysis of food security indicators in the Republic of Chad. In the table 1 you can find some of the most important indicators in comparison with the regional and world indices [5].

Table 1

Food security indicators, 2016

Indicators	Chad	Sub-Saharan Africa	World
Depth of the food deficit (kilocalories per person per day)	264,0	136,6	93,0
Improved water source, rural (% of rural population with access)	44,8	52,6	81,5
Improved sanitation facilities (% of population with access)	12,0	29,6	63,6
Life expectancy at birth, total (years)	51,2	56,9	71,0
Malnutrition prevalence, weight for age (% of children under 5)	30,3	21,0	15,0
Maternal mortality ratio (modeled estimate, per 100,000 live births)	980,0	510,0	210,0
Mortality rate, under-5 (per 1,000 live births)	138,7	92,2	45,6
Percentage of Population in Rural Areas (in % of Total Population)	77,7	62,8	46,5
Poverty headcount ratio at \$ 1.25 a day (PPP) (% of population)	36,5	46,8	14,5
Prevalence of anemia among children (% of children under 5)	73,6	62,5	42,5
Prevalence of wasting (% of children under 5)	15,7	9,4	7,9

Let us examine the next indicators in details: malnutrition prevalence, mortality rate, poverty headcount ratio.

It follows from the table that there exist a close and logical link between the three indicators. It does not matter on which level to examine the series — the world, the continent or the country, one can trace the following regularity: the higher the poverty level is, the higher the percentage of malnutrition and, accordingly, the death rate is.

The poverty rate in the country is a little lower than in the region. It can be connected with the specifics of economic development of the country: for a number of indicators Chad ranks far from last among the other countries of Central Africa. For example, it takes up a leading position in cattle breeding.

On the whole, the indicators of food security in Africa and in the Republic of Chad exceed to a considerable degree similar world indicators, which

once again proves acuteness of the problem both on the continent and in the country.

Let us turn to the economic impact analysis (tabl. 2).

Table 2

Food security indicators of Chad, 2016

Country	Code	Pop	L	Y
Chad	TCD	11525496,0	4551979,1	18853912658,9
	K	Alpha	A	infmort
	23672849609,4	0,3	274,4	89,4

Where: Code — Three-digit country code, Pop — Population, L — Labor Force, Y — GDP (2005 const. US Dollars), K — Capital, Alpha — Production elasticity of capital, A — Total Factor Productivity, Infmort — Mortality rate, infant (per 1,000 live births).

GDP per capita income can be represented by the function:

$$y = Ak^{\alpha}$$

The total factor productivity or “A” in the Chad is 274,4, the production elasticity of capital is 0.3 and the capital per worker or “k” is 5200,6.

$$k = \frac{K}{L} = 5200,6$$

$$y = 274,4 * 5200,6^{0,3} = 4141,9$$

GDP per capita income or $y = 4141,9$ \$ USA.

Our food insecurity indicator is infant mortality. Infant mortality for Chad is 89,4.

$$b1 = - \frac{b1\%A}{1\% \text{ Infant mortality}}$$

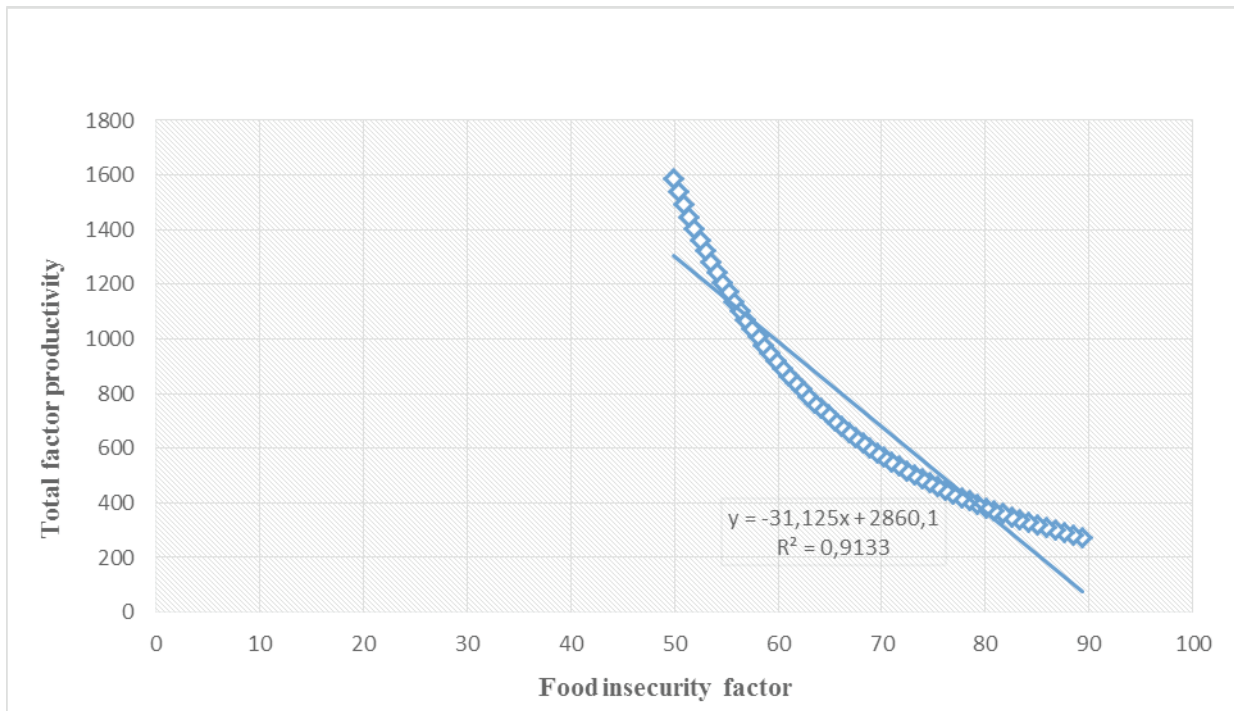
$$b1 = -3,07$$

$$\ln A = \text{constant} + b1 * \ln \text{Infant mortality}$$

Constant is 2,718

$$\ln = 2,718 - 3,07 * \ln 89,4 = -11,07$$

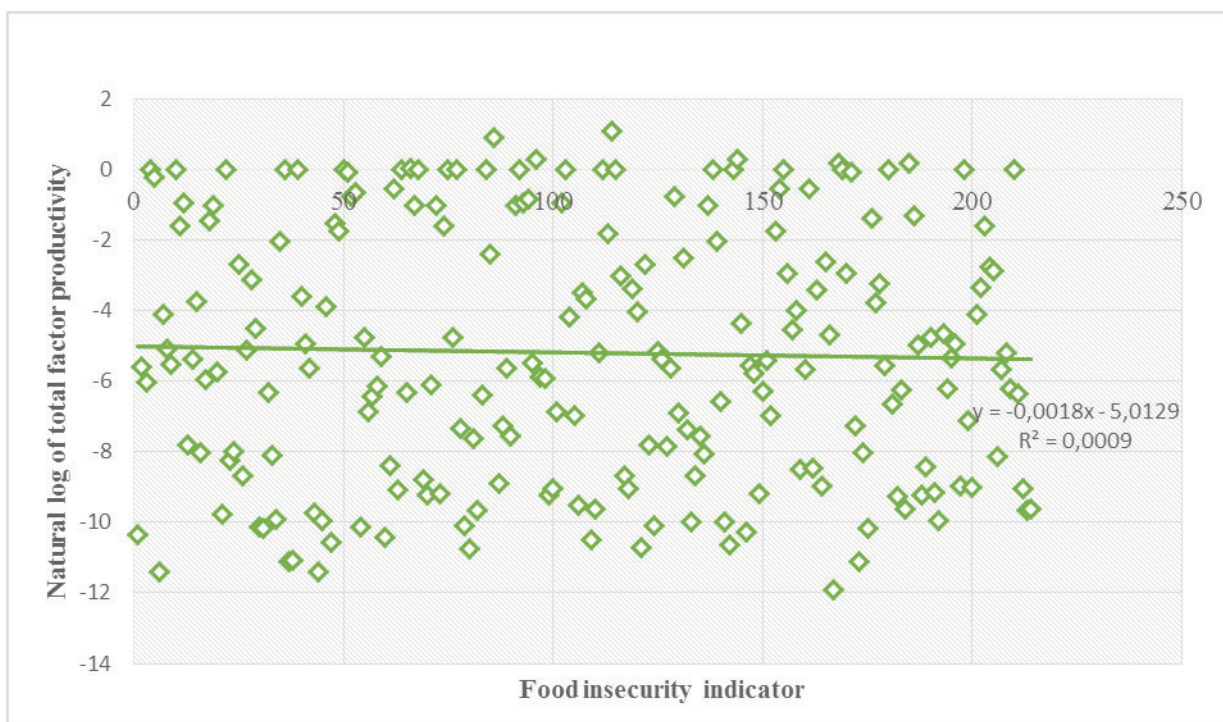
Now we show dynamic of changing Infant mortality from 89,4 to 50 by every percent (Pic. 1).



Picture 1. Dynamic of changing infant mortality in Chad, 2016

Using all available data points in the data set and Excel, we generated a scatter plot with the natural log

of total factor productivity on the y-axis against your food insecurity indicator on the x-axis (Pic. 2).



Picture 2. Scatter plot, 2016

Table 3

Infant mortality without /with food security policy, 2016

Infant mortality	89,4
Infant mortality with Food Security Policy	50
Change in Infant mortality	-0,44072
Elasticity	-3,07

Table 4

Changing of total factor productivity and output per worker, 2016

A current	274,4	GDP current	4141,9
A with infant mortality reduction	645,63	GDP with infant mortality reduction	9744,2
Difference between GDP			5602,3

Reduction of infant mortality from 894 to 50 will increase total factor productivity and output per worker. Chad will be richer on \$ 5602,3 per worker, and total GDP will be higher on 25501 million dollars (table 3,4).

The analyses of the above indicators has shown the existence of the food security problem in the Republic of Chad. Based on the data obtained the following ways to solve the problem were suggested. They are divided in three major directions: to decrease the poverty rate, the budget deficit and the mortality rate.

Here are the ways to decrease the poverty rate suggested. The first is international and state help for the poor. The creation of specialized trust funds may increase the size of assistance for the Third World countries. For instance, Russia along with other donor countries has taken part in several essential global initiatives including debt relief for the countries with high external indebtedness, AIDS, tuberculosis and malaria control.

Secondly, policy of redistribution should be held in these countries. Differentiation of the tax

rates should be implemented depending on personal income. Substantial changes in the system of taxes are needed including tax remissions and preferences for the development of business (especially small).

Focusing on the ways to decrease the malnutrition prevalence we suggest stabilization of the agricultural sector. Introduction of biotechnologies based on the experience of other countries is needed (nurture of high yielders and selection of productive cattle breeds, struggle against agricultural diseases and pests, droughts). The special focus should be on reforms giving the right to use maximum lands as areas under crop.

More than that intensification of agriculture in reclamation areas is suggested (fertilizer application). An improvement in production level in agricultural sector may be achieved through more productive utilization of cultivated areas with new technologies, modern forms of labor and production organization. Nowadays intensification is a major form of expanded reproduction in agriculture.

Another suggestion is investment in development of human resources through raising the education level of the poorest, which can considerably improve the economy of the country. The international organizations like the UN and the World Bank play here a great role. To achieve it a crucial factor is creation of a full-fledged social infrastructure.

Another important instrument for minimizing a food security problem is decreasing the mortality rate. As a key measure we can point out increase in financing the health system including creation of conditions for the birth of healthy children, adoption of the techniques of diagnosis and prevention of hereditary diseases, participation in international health projects (Chad takes one of the last places in the world on the vaccination level).

In this direction a group of the World Bank works especially hard. Among the major directions in their activity there are: maintenance of healthy food and population, aimed at infectious diseases control; improvement of nutrition; greater attention to reproductive health of the population; enhancement of healthcare system through staff reforms, pharmaceutical policy and providing sustainable and adequate financing.

In our opinion, implementation of these measures can considerably improve the food security situation in the Republic of Chad. Reading and analyzing reports of international referenda and summits, we can conclude the following: the world has all the knowledge and instruments to prevent or to considerably decrease the negative effects of the food security problem. Creation of the basics of the world food security is a system task, the solution of which starts on the global level and concerns every single man.

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